SVL, and this problem was more severe for larger snakes.

Because SVL measurements in conscious snakes are both precise and accurate, it should be possible to detect instances of shrinkage (Madsen and Shine 2001; Wikelski and Thom 2000) if they do occur in snakes. Based on the small magnitude and low frequency of negative growth estimates in this population (Blouin-Demers et al. 2002), it seems unlikely that shrinkage occurs. Individual cases of apparent shrinkage were thus likely due to measurement error.

In summary, my data suggest that the best way to measure the SVL of snakes is by anesthetizing them and laying them next to a ruler. If this method is not practical, measuring them conscious with a flexible tape (Fitch 1987) is a reasonable alternative.

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Multiple Recaptures of a Hybrid Hawksbill-Loggerhead Turtle in the Ten Thousand Islands, Southwest Florida

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The Miami Laboratory of the National Marine Fisheries Service (NMFS) conducted a study to determine the distribution and abundance of immature sea turtles in the nearshore waters of southwest Florida. Standard mark-recapture techniques were used as described in Eckert et al. (1999), and tissue samples were taken from green, loggerhead, and hawksbill turtles for genetic analysis.

The NMFS turtle survey documented the presence of immature Kemp's ridley (*Lepidochelys kempi*), loggerhead (*Caretta caretta*), and green (*Chelonia mydas*) sea turtles in the coastal waters of southwest Florida, in order of decreasing abundance. One turtle, originally identified as an immature hawksbill (*Eretmochelys imbricata*), was captured on 15 October 1998. Hawksbill turtles are considered a tropical species more commonly found in coral reef habitats (Meylan 1992; Witzell 1983), and it seemed unusual that this turtle was caught in the turbid waters of the Ten Thousand Islands in southwest Florida. The turtle's shape, scale pattern, and color were not readily distinguishable from a "normal" hawksbill. However, nuclear DNA analysis demonstrated that this animal was, in fact, a hawksbill-loggerhead hybrid, a rare phenomenon previously documented (Bowen and Karl 1997; Karl et al. 1995). Researchers from the University of South Florida in Tampa, Florida analyzed tissue samples from the turtle. Maternally inherited mtDNA was used to resolve maternal parent. The control region sequence from the mitochondrial DNA matched *Caretta caretta* haplotype A, indicating that the maternal parent was a loggerhead. Restriction digests of three nuclear DNA loci (CM-12A, CM-28, CM-14A) were performed using restriction enzymes *Rsa I*, *Bst NI*, and *Dra I*, respectively. Together, these three digests indicate the turtle is a post-first generation (F1) hy-

TABLE 1. Capture dates and recorded sizes of an immature hybrid hawksbill turtle recaptured in the Ten Thousand Islands, southwest Florida.

Date (m/d/y)	MSCL[1]	Weight (kg)	Days Free
10/15/98	52.2	20.8	0
07/05/99	54.5	—	263
08/02/99	—	—	296
11/16/99	59.5	25.8	418
09/04/00	64.6	—	711

[1]Medial straight carapace length (notch-to-notch).

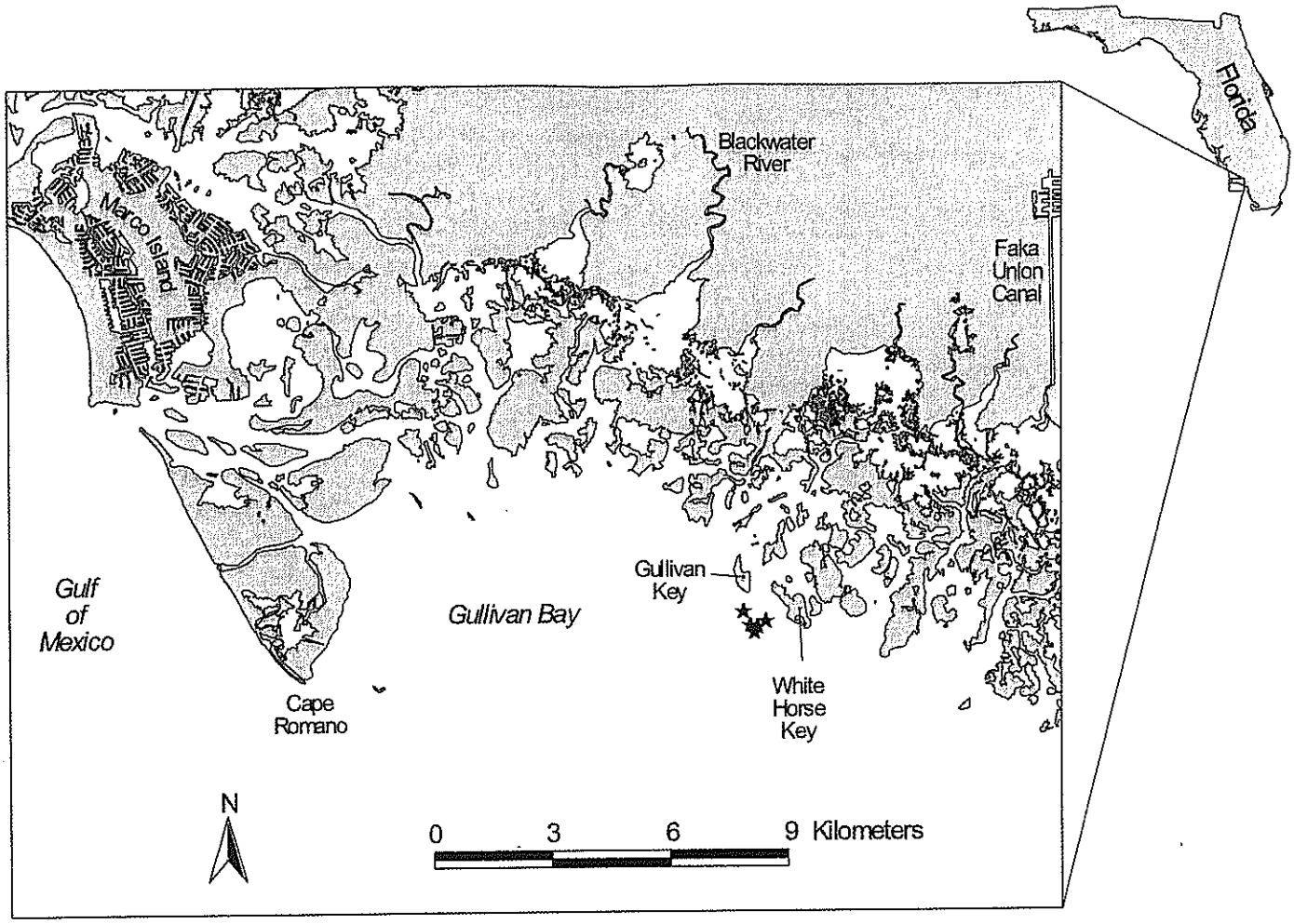

FIG. 1. Ten Thousand Island study area with multiple recapture sites of an immature hybrid hawksbill-loggerhead turtle.

brid between *Caretta caretta* and *Eretmochelys imbricata*. Bowen et al. (1993) provided a molecular phylogeny of sea turtles and concluded that the hawksbill-loggerhead split was nearly 20 million years ago, and the hawksbill-loggerhead hybrid is unique because there are few hybrids between vertebrate species separated by more than five million years.

Intensive surveys in Gullivan Bay have documented only this one putative hawksbill turtle, the majority of turtle sightings being immature Kemp's ridleys. The turtle was recaptured four times over 711 days (Table 1), and all recaptures were within 600 m of the initial capture location. This suggests that the turtle had established a home range within a non-typical hawksbill habitat between Gullivan and White Horse Keys (Fig. 1). The home range of the five recaptures encompasses 14.11 ha, consistent with the home ranges of immature hawksbills on tropical coral reefs (Van Dam and Diez 1998). The small home range suggests that this turtle had located an isolated hard-bottom community with sufficient food to keep it in the vicinity for close to two years. These hard-bottom community organisms typically consist of various sponges, bryozoans, and tunicates.

The warm estuarine environment of coastal southwest Florida promotes the growth of encrusting organisms. This turtle was noted as having "numerous barnacles on carapace, plastron, head and axial regions of flippers" (Fig. 2), indicating that it had resided within these waters for some time prior to first capture. An oyster and additional barnacles were noted on the subsequent captures. On the last capture, an astonishing mass of barnacles, tunicates, and bryozoans was noted on the carapace, in addition to a myriad of attendant crustaceans (Fig. 2). Epibiota communities like these are more commonly found on loggerheads (Dodd 1988) than hawksbills (Witzell 1983). In spite of this growth, the turtle appeared to be robust and healthy. The turtle grew from 52.2 cm to 64.6 cm during 711 days (6.5 cm/year) and gained 5 kg (2.6 kg/year). A substantial head wound above the left eye was noted at the 16 November 1999 capture. The cause of the wound is unknown, but it was healed by the 4 September 2000 capture, illustrating the powerful recuperative capabilities of this individual.

Reports of hawksbill turtles from non-coral reef habitats are uncommon. Hawksbills have been documented from a mangrove habitat in El Salvador (Hasbun et al. 1998) and the turbid northern Gulf of Mexico waters (Rester and Condrey 1996). Interestingly, Carr (1952) reported hawksbills from mangrove-bordered bays, including three turtles that had eaten large quantities of red mangrove fruit, leaves, and bark. Perhaps these turtles were also hawksbill-loggerhead hybrids, as the photo of the specimen from the northern Gulf of Mexico suggests (Rester and Condrey 1996). The apparent residency of a hybrid hawksbill-loggerhead turtle in the Ten Thousand Islands is considered very unusual, primarily because this turtle had the gross appearance of a hawksbill, but it also collected epibionts on the carapace similar to loggerheads

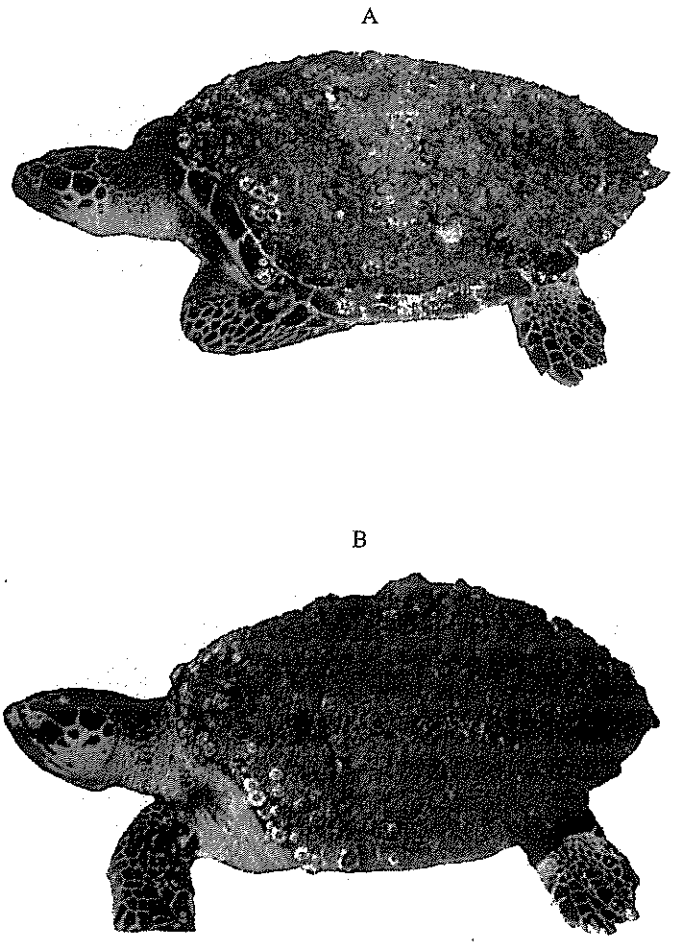

FIG. 2. Immature hybrid hawksbill-loggerhead turtle at first capture (A) and after 711 days (B), illustrating extensive epibiont growth.

and inhabited a habitat more typical of a loggerhead than hawksbill.

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Observations of Mating Behavior and Reproduction in the Scincid *Carlia jarnoldae*

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We observed the mating behavior of *Carlia jarnoldae* during austral summer (January–March 1999) in Townsville, Queensland, Australia (19°19'S, 146°45'E). *Carlia jarnoldae* are relatively small (mean snout–vent length 40 mm), terrestrial, diurnal lizards (Cogger 2000). Adults are sexually dimorphic: males are heavier (2.4 g vs. 1.9 g), but not longer (adult males average 44 mm SVL, 68 mm tail length; females average 43 mm SVL, 64 mm tail length), and males are more colorful than are females (Cogger 2000). Breeding males have an orange-brown dorsum with 4–6 narrow black stripes, a black dorsolateral field scattered with small blue spots, and a reddish-orange lateral stripe. The labial scales and throat of males are pale greenish-blue. Females are brown above with scattered black and white flecks tending to form longitudinal lines, and a bright white lateral stripe bordered above and below by black stripes.

We observed 16 social interactions in which a single adult female was placed into a 1000 L (200 x 100 x 50 cm) oval, semi-natural outdoor enclosure with an adult male. We also made observations of ten individuals in nature. Observations were conducted from behind a freestanding hessian blind. Four copulations were observed in the experimental enclosures (one of these took place under a shelter and could not be observed) and two in the wild.

Courtship.—Males tongue-flicked females during courtship. This behavior occurs in other lizards and suggests an important role of chemical cues in sexual identification and stimulation (Carpenter and Ferguson 1977; Mason 1992; Perrill 1980). Courtship was observed in seven of the social interactions conducted in the enclosures, but resulted only once in copulation.